

Cancer in American Samoan Women

INTRODUCTION

American Samoans have a long and rich heritage dating back to the settling of the Samoan archipelago before 1000 B.C. The archipelago, consisting of nine islands in the southwest Pacific Ocean about 2,330 kilometers from New Zealand, served as a point of departure for the Polynesian colonization of the other Pacific islands. Europeans first reached the islands in A.D. 1722 and began inhabiting them in 1836.

The United States has controlled the eastern part of the Samoan archipelago, including the islands of Tutuila, Aunu'u, and Manu'a, since 1899. American Samoans began to migrate to Hawaii and the U.S. mainland in the 1920s, but the greatest influx occurred in the 1950s with the end of the U.S. naval administration in American Samoa (Hecht et al., 1986; Janes, 1990). The migratory patterns can be categorized into three phases: migration under military auspices in the 1950s, the kin-linked family migration from the late 1950s to the late 1960s, and the more recent immigration of the elderly.

American Samoans have migrated to the mainland primarily to improve educational opportunities, enhance living conditions, and in some instances, better their financial circumstances to support their family members on the islands. American Samoan women tended to migrate to Hawaii or the U.S. mainland primarily to join other family members, to help relatives with household chores and work, or to attend school (Janes, 1990).

Today, American Samoans are the largest Pacific Islander group after Hawaiians, constituting 17 percent of the total Pacific Islander population (U.S. Census Bureau, 1993). There are about 118,000 American Samoans in total, and they live primarily in the U.S. Territory of American Samoa and in a few urban areas in the United States, principally in California and Hawaii. Estimated American Samoan populations in these three locations are 55,000, 32,000, and 15,000, respectively (1990 Census; American Samoan government, 1995). There are about 40,000 adult American Samoan women. The majority of American Samoans on the islands (i.e., in the U.S. Territory) reside on Tutuila; those in California reside mostly in Los Angeles and San Francisco Counties; and those in Hawaii live primarily on the island of Oahu (Pacific American Foundation, 1994).

Despite contact with non-Polynesians for more than a century, American Samoans have retained much of their Polynesian culture and heritage. Central to the way of life is their kin (*'aiga*), their chief, their church, and their village. They are conscious of sharing these cultural and social forms called *fa'aSamoa* (the

Samoan way). An important component of the American Samoan social structure is the *matai* system, a pyramid organizational structure in which an elected title holder (*matai*) functions as an administrator of the extended kin and represents them at village and district meetings. A combination of factors, including heredity, popularity, and ability, determines succession to the position of *matai*. Within a village or district, the *matai* system extends upward to include high chiefs (*ali'i*), high-talking chiefs (spokespersons for the high chiefs), and paramount chiefs (Hecht et al., 1986; Janes, 1990).

In the villages on the islands, women care for their families, whereas men work 25 to 30 hours a week in subsistence activities. The people eat a traditional diet that consists of taro, breadfruit, and rice. They are predominantly Christians. Families observe the traditional practices of prayer hour, curfew, and enforcement of chiefly authority over residents. Compared with life in urban environments, these practices contribute to a relatively calm and pastoral life. American Samoans tend to be self-sufficient, with strong systems of caring for the needs of kin groups through self-help networks. They prefer to turn to relatives, friends, and ministers for advice rather than asking "outsiders."

Like their counterparts on the islands, many American Samoans in California and Hawaii live in tightly knit and regionally defined communities, with close ties to the local churches. Many have remained closely bound to their families on the islands. They visit their homeland on ritual occasions, send monthly remittances to their families, receive new migrants, and often return permanently to the islands—practices that reinforce home ties to American Samoa. At the same time, many experience difficulties of adjustment. In part, these difficulties result from a negative stereotype of American Samoans as big, aggressive, and violent, especially for American Samoans in Hawaii. The negative stereotype, lack of employment and educational opportunities, and limited language skills often have contributed to high unemployment rates and abject poverty (Hecht et al., 1986). In California, American Samoans have settled primarily in communities where military personnel moved when the naval administration of the islands ended. Although American Samoan families tend to be less extended in California, the *'aiga* provides a network for assistance when, for example, American Samoans seek educational and employment opportunities. Churches have assumed the traditional role played by the *matai*. Unlike American Samoans in Hawaii, those in California were more successful in adapting to their new environment by the mid-1980s (Hecht et al., 1986).

BACKGROUND

Demographic Characteristics

American Samoans are a young and growing population. The population has increased rapidly in recent decades as a result of declining crude mortality rates (Crews, 1985), reduced infant mortality, and high

fertility rates (U.S. Census Bureau, 1993). American Samoans as a group are among the youngest of U.S. residents (U.S. Census Bureau, 1993). Their median age is 22 years, compared with 33 years for all persons in the United States and 25 years for Pacific Islanders. About 13 percent of American Samoans are younger than 5 years old; 57.7 percent are 18 and older, and 3.3 percent are 65 and older.

Women of childbearing age constitute 48.4 percent of the female population. The fertility rates of American Samoans are higher than those of many other ethnic groups. Although African Americans, Native Americans, Eskimos, and Aleuts have higher birth rates among women aged 15 to 24, American Samoan women have the highest rates for women aged 25 to 34 and 35 to 44. Indeed, the birth rates for American Samoan women are more than 60 percent higher than those for all U.S. women in these two age groups. The combination of relative youth and high fertility rates has resulted in large families for American Samoans. In 1990, an average family consisted of 4.8 persons, larger than the average family size for Pacific Islanders (4.0 persons) and all U.S. families (3.2 persons) (U.S. Census Bureau, 1993). The fertility rate on the islands shows significant regional variations and a consistent relationship between fertility and levels of education. Women with the highest levels of education, such as the residents of the Pago Pago area, have a lower fertility rate than those on the island of Manu'a, where the education levels are lower (Harbison, 1986).

American Samoan women are relatively more likely than other U.S. women to head households but less likely to receive a formal education (U.S. Census Bureau, 1993). For example, 73.7 percent of American Samoan households were married-couple families and 19.6 percent were female headed, compared with 78.6 percent and 16.5 percent, respectively, of U.S. households. The high rate of female-headed households can be attributed to a high rate of teenage pregnancies and women enrolled in public assistance programs, such as Aid to Families with Dependent Children. American Samoan women have significantly lower levels of education than Pacific Islander women and U.S. women. In 1990, the percentage of American Samoan women aged 25 and older who had received a high school diploma was 66.5 percent, compared with 75.0 percent for Pacific Islander women and 74.8 percent for all U.S. women. College attendance for American Samoan women was even lower; only 6.1 percent had received higher education, compared with 9.6 percent for Pacific Islander women and 17.6 percent for all U.S. women.

The majority of American Samoans speak a language other than English at home (U.S. Census Bureau, 1993). In 1990, 63.9 percent of those 5 years old and older spoke a Pacific Islander language at home. Nearly one third (32.4 percent) of American Samoans did not speak English "very well." More importantly, nearly 1 in 10 (9.2 percent) were linguistically isolated—that is, they lived in households in which no one aged 14 or older spoke only English and no one who spoke a language other than English spoke English

very well. Compared with American Samoans, substantially fewer Pacific Islanders (24.9 percent) spoke a Pacific Islander language at home.

Socioeconomic Status

The 1990 Census data showed that, in comparison with Pacific Islander groups and the U.S. general population, American Samoans were least likely to be employed (U.S. Census Bureau, 1993). Less than two thirds (63.7 percent) of those 16 and older were in the labor force, compared with more than 70 percent of Pacific Islanders overall. Participation in the labor force by American Samoan women aged 16 and older was comparable to that of similarly aged women in the United States (54.8 percent versus 57.0 percent), although the rate was lower than that for Pacific Islander women aged 16 and older (62.5 percent). Slightly more than 1 in 10 (10.7 percent) American Samoan women aged 16 and older were unemployed, compared with 6.9 percent of Pacific Islander women and 6.2 percent of U.S. women in the same age group. American Samoans were somewhat more likely than Pacific Islanders to have one-worker families (29.5 percent versus 26.1 percent) and less likely to have two-worker families (39.7 percent versus 45.5 percent).

American Samoans' per capita incomes are among the lowest of all American ethnic groups, and their poverty rate is among the highest (U.S. Census Bureau, 1993). In 1990, the American Samoan per capita income of \$7,690 was about half the U.S. per capita income of \$14,143 and about three fourths of the Pacific Islander per capita income of \$10,342. The per capita income for American Samoan women was even lower, at \$5,952. In 1989, 25.8 percent of American Samoans lived below the poverty level, compared with 17.1 percent of Pacific Islanders and 13.1 percent of the U.S. population.

Health Status

No comprehensive study has examined the health status of American Samoans. The few studies that have explored this topic have been limited in scope, focused on a specific medical condition (such as obesity or diabetes), and based on small samples from only one of the sites where American Samoans live. These limitations should be kept in mind when one considers the following data on the health status of American Samoan women, including mortality rates and prevalence of chronic conditions such as obesity, diabetes, and cardiovascular disorders.

Since 1950, mortality rates have declined among American Samoans, a change attributable to a decrease in deaths caused by infectious diseases. However, deaths from chronic conditions such as cardiovascular disorders, degenerative disorders, and cancer have not changed, and deaths from other chronic conditions such as diabetes have increased. Compared with U.S. women as a whole, American Samoan

women had higher death rates from diabetes and cardiovascular disorders in the mid-1980s (Crews, 1985).

Several researchers have found a high prevalence of massive obesity in American Samoan adults in Samoa and Hawaii and on the U.S. mainland (Baker et al., 1986; McGarvey, 1991; Pawson, 1986; Pawson and Janes, 1981, 1982; Hodge et al., 1994). Women are more likely than men to be overweight. Furthermore, American Samoan women have a higher-than-average body mass index and excessive adipose tissue. Obesity often develops early in life and results, in part, from environmental and other influences, such as a lack of physical activity, maintenance of traditional rites (e.g., Sunday feasting), reduced intensity of physical work, and low education levels. Chronic medical conditions related to obesity also appear to be more prevalent among American Samoan women. For example, they have a higher prevalence of hypertension, hyperinsulinemia, and diabetes, and more unfavorable blood lipid profiles than other ethnic groups (Crews, 1989; McGarvey and Schendel, 1986; Pawson and Janes, 1982; Pelletier and Hornick, 1986; Galanis et al., 1995; Collins et al., 1994).

CANCER STATISTICS

Data Sources

There is a paucity of published data about cancer among American Samoan women. Until recently, the lack of a specific identifier for American Samoans made evaluation of cancer statistics difficult. With the addition of an identifier, it is now possible for cancer surveillance programs to assess the incidence of various cancers in this population. The statistics provided come from the National Cancer Institute's (NCI) Surveillance, Epidemiology, and End Results (SEER) Program public use database and a 1985 report by the South Pacific Commission, *Cancer in Pacific Island Countries*. Data from the American Samoa Department of Public Health, another potential data source, were not available for review. The data collection methods and their limitations are described below.

Surveillance, Epidemiology, and End Results Program. The SEER Program, a population-based cancer registry, obtains information on all cancer diagnoses in 11 geographic areas throughout the United States. Of the 11 SEER registries, Los Angeles County and Hawaii contain 69.5 percent of the American Samoan cases.

Ethnic identifiers for individuals of Samoan heritage have been collected by the SEER registry since 1991. SEER classifies each cancer diagnosis as to site and histologic groupings based on topographic and morphologic codes of the International Classification of Diseases for Oncology. Quality control standards require that identification of cancer cases be 97 percent complete and that 95 percent of submitted

records pass a series of computerized edits with no more than 1 percent of records failing any single edit (National Cancer Institute, 1998).

Report on Cancer in Pacific Island Countries. The American Samoa Department of Public Health maintained a tumor registry manually until 1991, when Hurricane Val destroyed it. Unfortunately, there was no other copy of the lost data. The Office of Vital Statistics has mortality records for cancer deaths from 1980 to 1993; however, cancer deaths are underestimated for two reasons. First, the islands have limited diagnostic capabilities and the cause of death often is not known. Second, hospitals often transfer very ill patients to Hawaii for care, and if the patient dies there, the cause of death is not always recorded in American Samoa. The islands have only one major hospital where cancer patients receive care—the L.B.J. Tropical Medical Center in Pago Pago. However, Hurricane Val also destroyed that hospital's computer database, and it has not yet been reinstated. The records exist in manual form, but they are not organized systematically. As a consequence, current cancer statistics are not available from the American Samoa Department of Public Health.

Because of the inaccessibility of current cancer statistics from American Samoa, the cancer incidence data presented below come from the 1985 report prepared by the South Pacific Commission, *Cancer in Pacific Island Countries*. For the report, the commission obtained data on all newly diagnosed cancer cases in American Samoa from abstracts of pathology files at the L.B.J. Tropical Medical Center and from records of the population-based cancer registries in Los Angeles County and Hawaii. The report estimates that up to 25 percent of cancer cases from American Samoa may have been diagnosed elsewhere and that the estimated completeness of the cancer registry in American Samoa was 85 percent between 1976 and 1981 (the period covered by the report).

Data Sources' Limitations

There are four primary limitations with regard to the data from sources cited in this chapter. First, the completeness of the data is uncertain. The relatively small number of American Samoan women diagnosed with cancer in Los Angeles County, Hawaii, and the other SEER registries make inferences based on cancer statistics somewhat tenuous. Second, the data lack a denominator. Until the 1980 and 1990 Census, the number of American Samoans on the U.S. mainland or in Hawaii had not been systematically assessed. Despite the recent inclusion of American Samoans in the census enumeration, considerable doubt remains about its completeness, thus precluding accurate denominator data. As a consequence, the data generated from these sites are most appropriate for an examination of proportional incidence of site-specific cancer rather than total cancers. Third, cancer registration is complicated by the frequent movement of American-Samoans among three locations—the U. S. mainland, Hawaii, and the islands in the U.S. Territory. These three factors and inadequate follow-up of the diagnosed cases has

made it difficult to compute many useful cancer statistics, such as stage at diagnosis and survival and mortality rates.

Incidence Rates

The following analyses represent incident cancers diagnosed between 1992 and 1998 among American Samoan women in the SEER database. SEER identified 346 incident cancers during this period among American Samoan women. Because of the small number of cancers diagnosed, it is expected that incidence rates would be unstable. Furthermore, because the American Samoan population is small, enumeration errors in the census would result in observable differences in incidence rates. Thus, to estimate the risk of particular types of cancer in American Samoans, their relative distribution was compared with that of U.S.-born White women using a nested case-control study approach. This approach is similar to that of a hospital-based case-control study in which controls are patients with diagnoses thought not to be associated with the risk factor under study. In this case, the risk factor of interest was American Samoan origin, based on information about a patient's birthplace and ethnicity. Each type of cancer was assessed separately, with all other cancer sites used as controls; in these analyses, overall risk for the mixture of different cancers was assumed to be unrelated to birthplace. Table 1 shows the distribution of cancer by age for American Samoan women and White women, and Table 2 shows the distribution of cancer in these two groups by site.

As seen in Table 1, which is based on data from 1992 to 1998, American Samoan women with cancer were more likely than U.S.-born White women to be diagnosed at an early age. Over one quarter (26.0 percent) of the American Samoan women were between the ages of 25 and 44 when diagnosed with cancer, compared with 10.6 percent of U.S.-born White women. An additional 15.3 percent of American Samoan women were aged 45 to 54 when diagnosed, compared with 13.6 percent of U.S.-born White women. Because American Samoans are relatively younger than the general population, cancers that typically occur among younger women may be more common in the American Samoan population.

Breast cancer was the most common cancer among American Samoan women (see Table 2). Nearly one quarter (22.3 percent) of cancers diagnosed among American Samoan women were this form of the disease, followed in frequency by cancers of the uterus (11.6 percent), lung (11.0 percent), stomach (7.8 percent), and ovary (5.8 percent). With one exception, the distribution of the top five cancers was similar to the distribution for U.S.-born White women. White women with cancer most often had breast cancer (31.3 percent), followed in frequency by cancers of the lung (12.2 percent), uterus (6.0 percent), and ovary (4.2 percent), and non-Hodgkin's lymphomas (3.8 percent). Compared with U.S.-born White women, American Samoan women had a higher frequency of cancers of the uterus and stomach and a lower frequency of melanomas of the skin.

Table 3 reports cancer incidence among American Samoan women on the islands from 1976 to 1981. Approximately 17 percent of mortality in American Samoa at that time was attributable to cancer. The most common cancer sites among American Samoan women were breast (22.2 percent), cervix (12.1 percent), lung (10.1 percent), and stomach (9.1 percent).

Analyses of proportional incidence ratios (PIRs) for 1976 through 1981 in American Samoa showed alarmingly high ratios for selected cancers in American Samoan women. PIR is defined as a measure of the proportional contribution of a cancer at a specific site to total cancers reported, in relation to a standard population (in this case, White women in Los Angeles). A PIR of 100 for a specific cancer indicates that the proportional incidence of the cancer is the same in the population under study as in the standard population (adjusted for age and sex); that is, there is no difference in the proportion of cancer patients with a specific cancer in the two groups under study. Here, PIRs well above 100 indicate that, compared with White women in Los Angeles, American Samoan women had excessively higher proportions of cancers of the stomach (PIR=796), liver (PIR=603), bone (PIR=406), connective tissue (PIR=241), and pancreas (PIR=209). Other cancers, such as lymphoma (PIR=135) and those of the thyroid (PIR=168) and oral-pharynx (PIR=138), showed a moderately higher relative incidence among American Samoan women on the island in the same period. However, cancers of the breast (PIR = 69), cervix (PIR=63), and colon (PIR=50) showed a lower PIR among American Samoan women than among White women in Los Angeles.

Risk Factors

Little information exists on the prevalence of cancer-related risk factors, such as smoking, alcohol use, and diet among American Samoan women. The limited information available comes from the Samoan Studies Project (Baker et al., 1986). There are no data on sexual practices, occupational exposure to toxins, and other behavioral, environmental, or genetic risk factors that may increase American Samoan women's susceptibility to cancer.

Smoking. Based on the available data, about 89 percent of Samoan women in American Samoa do not smoke (Bindon and Crews, personal communication, June 1995). The approximately 11 percent of women who are smokers smoke 11 to 20 cigarettes per day. Cigarette smoking is more prevalent among "modernized" women who live in or around the village of Pago Pago on Tutuila Island than among "traditional" American Samoan women who live on the outlying Manu'a islands. No comparative data are available on the prevalence of tobacco use by American Samoan women in Hawaii or on the U.S. mainland. There is also no information available on the type, amount, or duration of tobacco use.

Alcohol Use. In a small sample of people in American Samoa, Baker and colleagues (1986) found that approximately 20 percent of American Samoans drank alcohol at the time of the study and an additional 18 percent were former drinkers. Of the current drinkers, 21 percent drank more than seven drinks per week. Women drank less alcohol than men. Comparable data about alcohol use among American Samoans in Hawaii and on the U.S. mainland are not available.

Diet. The dietary habits of American Samoans reflect modernization and migration (Hanna et al., 1986). The diet of the late 19th century consisted largely of breadfruit, bananas, taro, coconut, and reef resources, such as fish. Recent modernization and migration have led to a shift in diet that includes more nontraditional foods, such as pork and chicken. The importation of these foods has had a significant impact on current consumption patterns, contributing to certain nutritional deficiencies among American Samoans. Calcium, iron, and thiamine deficiencies are most pronounced among more modernized American Samoans, compared with those less likely to be exposed to nontraditional diets. The typical Samoan diet is high in total energy, fat, and saturated fat, and low in fiber (Galanis et al., 1999).

Knowledge, Attitudes, and Practices

The limited amount of data available about general health beliefs and utilization of health care services among American Samoans suggest that two broad sets of health beliefs may influence their help-seeking behaviors (Cook, 1983; Janes, 1990; Macpherson and Macpherson, 1990). According to these belief systems, only certain conditions are treatable by Western (*palagi*) medicine, whereas many medical conditions are resistant to such treatment. These views stem from the belief that disease etiology is multifactorial, including elements of the supernatural world, morality, and social relationships. American Samoans believe that illnesses result from an imbalance among these elements, and disease etiology often may be attributed to one's actions, punishment from God, or simply germs.

Within this belief system is a class of illnesses that are unique to Samoans: Samoan sicknesses, or *māi Samoa*. These illnesses result from the actions of malevolent spirits (*aitu*) against the living for violations of cultural or moral proscriptions (Janes, 1990). Possession, a condition resistant to Western medicine, is the most common mechanism by which malevolent spirits convey their displeasure.

This culturally based belief system of disease etiology greatly influences American Samoan help-seeking behavior (Cook, 1983; Janes, 1990; Macpherson and Macpherson, 1990). American Samoans prefer to use traditional healers, who may be herbalists (*foma'i*); "general practitioners" (*taulasea*); power healers, who specialize in curing spirit possession through supernatural powers; or diviners, who have the ability to determine disease etiology. Included in the traditional healers' repertoire are massage therapies (*fofo*), herbal concoctions, and communication with malevolent spirits.

An appreciation of these culturally based beliefs contributes to an understanding of the utilization of the health care system by American Samoans. Health care providers in Hawaii and on the U.S. mainland may think that American Samoans neglect sick family members because they visit a Western health care provider only when illnesses are acute. Providers may greet this delay in seeking health care with frustration, anger, and accusations of neglect and noncompliance. On the other hand, American Samoans often view such accusations as unjust because generally they have tried various Samoan remedies to alleviate the signs and symptoms of illnesses before visiting a Western health care provider.

Cancer knowledge and attitudes among Samoans differ by place of residence. Most Samoans have some positive attitudes about cancer prevention and treatment. However, Samoans living in American Samoa and Hawaii are more likely than residents of Los Angeles to believe that cancer is caused by *aitu* or spirits, that cancer is a punishment from God, and that cancer can be cured by *fofo*, or traditional Samoan healers (Mishra et al., 2000).

Besides being influenced by cultural differences in health and illness models, access to medical care for American Samoans may be limited by economic factors (Janes, 1990; Mishra, 1994). Such barriers are especially pertinent to those on the U.S. mainland. Because of their poor economic standing and limited employment opportunities, these American Samoans often have to rely on welfare, private insurance, workers' compensation benefits, and "medically indigent" care services (Janes, 1990; Mishra, 1994). Furthermore, the structure and organization of the health care system can impede access. Because of their limited experience with government institutions and limited proficiency in English, American Samoans may view the centralized, bureaucratic, and socially stratified health care system as imposing and complex. In contrast, residents of American Samoa have access to care provided through the government-owned and -operated territorial health care system at a nominal cost that even the poorest citizen usually can afford. American Samoans in Hawaii benefit from its unique health care system, which is based on a combination of mandated employment-based health insurance; a state health insurance program, which provides insurance coverage for those individuals in Hawaii who do not qualify for Medicaid or employment-based health insurance; and a Medicaid program, which has received a waiver from federal requirements to provide medical, dental, and mental health benefits through a managed care delivery system (Pacific American Foundation, 1994). As a result of these federal and state initiatives and private insurance, nearly all the residents of Hawaii have health insurance.

The different perspectives on health and illness, limited communication ability, doctor-patient conflicts in roles and expectations, and structural and economic constraints may restrict access to, and consequent utilization of, cancer control services by American Samoans. Few published sources of information

support these contentions; however, it is not difficult to speculate about the possible impact of these factors on cancer control efforts. Furthermore, there are few educational programs for cancer prevention specifically designed for and implemented among American Samoans. As a consequence, information is lacking on American Samoans' knowledge of or orientation toward prevention. A recent study of American Samoan women revealed that many would use traditional healers if available instead of Western medicine, and many believed that getting cancer meant death (Ishida et al., 2001). Likewise, negative feelings toward Western physicians may make American Samoan women reluctant to seek care. Finally, poverty and lack of health insurance, which have been shown to be major barriers to cancer control services for other minority groups in the United States, are prevalent among American Samoan women who live on the U.S. mainland.

FUTURE DIRECTIONS

This review of demographic and other characteristics of American Samoan women points out issues that may be important for future cancer control efforts. In general, American Samoan women are relatively young, have large families, have low levels of education, are poor, and often speak a language other than English. Also, they have culturally related health beliefs that may cause them to delay seeking care for medical illnesses, including cancer. American Samoan women are often overweight and suffer disproportionately from medical conditions associated with obesity, such as hypertension and diabetes mellitus. On the other hand, limited data suggest that they seldom smoke or abuse alcohol, and thereby benefit from avoidance of these cancer-related risk factors.

This review of cancer statistics has identified areas of concern and issues for future study. For example, American Samoan women are more likely than White women to be diagnosed with cancer at an early age. The incidence of breast cancer, the most common cancer among American Samoan women, is similar to that of other ethnic groups. However, American Samoan women have a relatively higher incidence of cancers of the corpus uteri, lung, and stomach, and a lower incidence of melanomas of the skin. Likewise, American Samoan women in Samoa who have cancer, compared with White women in the United States, appear to be relatively more likely to have cancers of the stomach, liver, bone, connective tissue, pancreas, and thyroid, and are less likely to have breast or colon cancer.

The reasons are not clear for the younger age at diagnosis or the different proportional incidence rates of various cancers among American Samoan women compared with other ethnic groups. Moreover, no reported cancer control interventions have been developed or instituted specifically for American Samoan women. The National Cancer Institute has expressed concern about the lack of culturally specific and sensitive intervention methods and assessment instruments for this and other native Pacific populations.

Recent cancer control intervention studies among other minority populations, such as American Indians, Alaska Natives, African Americans, and Hispanics, have demonstrated that intervention methods developed for the majority population may have limited relevance to the needs of these minority and medically underserved populations. Therefore, it is necessary to explore cancer-related knowledge, attitudes, and practices among American Samoans and to develop culturally sensitive interventions for them.

The paucity of data about cancer among American Samoan women points to many opportunities for future research. First, there is a need to update cancer statistics, clearly define age-based denominators, and confirm the validity of the limited data described here. Next, if these apparent findings hold up in recent years, it is important to better understand the reasons for differences between American Samoan women and other ethnic groups in key cancer indicators. Research should address the following questions: Why do American Samoan women develop cancer at an early age? What contributes to the differences in the relative frequencies of cancers among American Samoan women? Why are American Samoan women with cancer relatively more likely than other groups to have cancers of the corpus uteri, lung, stomach, and ovary? Why are American Samoan women with cancer relatively more likely to be diagnosed with cancer at an advanced stage? What are the differences in behavioral and environmental risk factors among American Samoan women on the U.S. mainland, in Hawaii, and in American Samoa? Robust methods must be designed for ascertaining reliable numerator and denominator data in American Samoa, in Hawaii, and on the U.S. mainland. Such methods are especially important in American Samoa, where there are no computerized archival data resources. In addition, the reliability of current American Samoan ethnic identifiers should be validated.

Further, there is a need to understand in greater depth the cultural interpretations of the health beliefs of American Samoans to facilitate comprehension of American Samoans' cancer-related knowledge, attitudes, and practices.

Based on a better understanding of American Samoans' cancer-related knowledge, attitudes, and practices, there is a need to design and implement effective and culturally sensitive cancer control programs. The prevalent health beliefs of American Samoans should be incorporated into the development of these programs.

Finally, research involving American Samoans poses serious and interesting methodological challenges that result in part from a lack of baseline information on their health status and health needs, the multiplicity of problems they experience, the variability in their adherence to traditional culture, and their geographical distribution in the Pacific Islands and Hawaii and on the U.S. mainland. Because of

American Samoans' geographical distribution and relatively small size, the research sampling methodology and comprehensive survey research used to study other ethnic minorities may not prove useful for research involving American Samoans. Appropriate sampling protocols must be designed to identify a representative sample and to generate a random sample of this hard-to-reach population. These sampling protocols may necessitate the use of a combination of stratified random, "snowball," and networking sampling techniques. Furthermore, data available from the U.S. Census Bureau, from community-based organizations such as churches and social service agencies, and through network and snowball procedures may be needed to develop and augment the representative sample. Another methodological challenge is the level of study. Comprehensive surveys among American Samoans at the three sites may not be feasible. Creative multimethod research protocols that combine qualitative techniques, such as ethnographies and focus groups, and quantitative techniques, such as survey research, may be needed for researching American Samoans.

CONCLUSION

Much remains to be learned about the cancer control needs of American Samoan women. The relatively small size of the American Samoan population, their migratory patterns, and their exposure to new lifestyle and environmental demands offer potentially interesting areas for research. Only after learning more about the health beliefs, access to health care, and prevalence of various cancers among this group will it be possible to design culturally sensitive cancer control interventions.